CLAIMS

What is claimed is:

1. A composition comprising an agent that specifically reduces apolipoprotein E4 (apoE4) domain interaction by at least about 10%.

2. The composition according to claim 1, wherein said agent is an organic molecule having a molecular weight in the range of from about 50 daltons to about 2500 daltons.

3. The composition according to claim 1, wherein said agent inhibits formation of a salt bridge between Arg-61 and Glu-255 of apoE4.

4. A composition comprising an agent that reduces apolipoprotein E4 (apoE4) domain interaction by at least about 10%, wherein said agent is an organic molecule having a molecular weight in a range of from about 50 daltons to about 2500 daltons, and wherein said agent inhibits formation of a salt bridge between Arg-61 and Glu-255 of apoE4.

5. A method of reducing apolipoprotein E4 (apoE4) domain interaction in a cell, comprising contacting a cell that synthesizes apoE4 with an agent that reduces apoE4 domain interaction.

6. The method of claim 5, wherein said agent is an organic molecule having a molecular weight in the range of from about 50 daltons to about 2500 daltons.

7. The method according to claim 5, wherein said agent inhibits formation of a salt bridge between Arg-61 and Glu-255 of apoE4.

8. A method of promoting neuronal cell growth, comprising contacting a neuronal cell that produces apolipoprotein E4 (apoE4) or that takes up apoE4 from its environment with an agent that reduces apoE4 domain interaction, whereby neuronal cell growth is promoted.

9. The method according to claim 8, wherein said agent is an organic molecule having a molecular weight in the range of from about 50 daltons to about 2500 daltons.

10. The method according to claim 8, wherein said agent inhibits formation of a salt bridge between Arg-61 and Glu-255 of apoE4.

11. A method of promoting neuronal cell growth, comprising contacting a neuronal cell that produces apolipoprotein E4 (apoE4) or that takes up apoE4 from its environment with an agent that reduces apoE4 domain interaction, wherein said agent is an organic molecule having a molecular weight in the range of from about 50 daltons to about 2500 daltons, and wherein said agent inhibits formation of a salt bridge between Arg-61 and Glu-255 of apoE4.

12. A method of reducing formation of neurofibrillary tangles in an individual, comprising administering to the individual an effective amount of an agent that reduces apoE4 domain interaction.

13. The method according to claim 12, wherein said agent is an organic molecule having a molecular weight in the range of from about 50 daltons to about 2500 daltons.

14. A method of reducing formation of neurofibrillary tangles in an individual, comprising administering to the individual an effective amount of an agent that reduces apoE4 domain interaction, wherein said agent is an organic molecule having a molecular weight in the range of from about 50 daltons to about 2500 daltons.

15. A method for reducing the risk that an individual will develop Alzheimer's disease (AD), comprising administering to an individual at risk for developing AD an effective amount of an agent that reduces apoE4 domain interaction, wherein said agent is an organic molecule having a molecular weight in the range of from about 50 daltons to about 2500 daltons.

16. A method for reducing the severity of a symptom associated with Alzheimer's disease (AD), comprising administering to an individual who exhibits a symptom associated with AD an effective amount of an agent that reduces apoE4 domain interaction, wherein said agent is an organic molecule having a molecular weight in the range of from about 50 daltons to about 2500 daltons.

17. The method according to claim 16, wherein the symptom associated with AD is selected from the group consisting of cognitive decline and memory loss.

18. A method for reducing apolipoprotein E4 (apoE4)-mediated inhibition of neurite outgrowth, comprising contacting a neuron that synthesizes apoE4 or that takes up apoE4 from its environment with an agent that reduces apoE4 domain interaction, wherein said agent is an organic molecule having a molecular weight in the range of from about 50 daltons to about 2500 daltons.

19. A pharmaceutical formulation comprising an agent that specifically reduces apolipoprotein E4 (apoE4) domain interaction by at least about 10%, and a pharmaceutically acceptable excipient.

20. The formulation according to claim 19, wherein said agent is an organic molecule having a molecular weight in the range of from about 50 daltons to about 2500 daltons.

21. The formulation according to claim 19, wherein said agent inhibits formation of a salt bridge between Arg-61 and Glu-255 of apoE4.

22. A pharmaceutical formulation comprising an agent that reduces apolipoprotein E4 (apoE4) domain interaction by at least about 10%, wherein said agent is an organic molecule having a molecular weight in a range of from about 50 daltons to about 2500 daltons, and wherein said agent inhibits formation of a salt bridge between Arg-61 and Glu-255 of apoE4; and a pharmaceutically acceptable excipient.

23. A method of reducing apolipoprotein E4 (apoE4) domain interaction in a bodily fluid, comprising contacting a apoE4 in the fluid with an agent that reduces apoE4 domain interaction.

24. The method of claim 23, wherein the fluid is serum.

25. The method of claim 23, wherein the fluid is interstitial fluid.

26. The method of claim 23, wherein said agent is an organic molecule having a molecular weight in the range of from about 50 daltons to about 2500 daltons.

27. The method according to claim 23, wherein said agent inhibits formation of a salt bridge between Arg-61 and Glu-255 of apoE4.

28. A method of reducing apolipoprotein E4 (apoE4)-mediated inhibition of neurite outgrowth in an individual, comprising administering to the individual in need thereof an agent that reduces apoE4 domain interaction, wherein said agent is an organic molecule having a molecular weight in the range of from about 50 daltons to about 2500 daltons.